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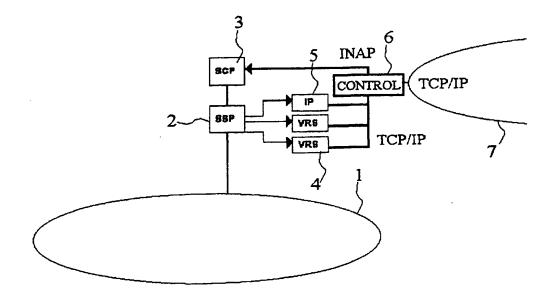
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(54) Title: INTELLIGENT NETWORK

(57) Abstract

Intelligent network (IN), comprising at least one Service Switching Point, SSP (2), at least one Service Control Point, SCP (3), one or more Intelligent Peripherals, IPs (5), and/or one or more Voice Response Systems, VRSs (4), which IN is capable of interacting with a PSTN or ISDN (1). The essence of the concept is an additional interface, in the form of a control member (6), between the IPs and/or VRs on one side and the Service Control Point(s) on the other side. Such makes it possible that the (advanced) IPs and VRSs are capable of exchanging all sorts of information with the SCP, without the IPs or VRSs consequently being occupied for an extended period of time. As a result, the SCP may dispose of (additional) information which in a regular IN cannot be made available to the SCP(s).

Intelligent network.

BACKGROUND OF THE INVENTION

The invention relates to an intelligent network (IN), comprising
at least one Service Switching Point, SSP, at least one Service
Control Point, SCP, one or more Intelligent Peripherals, IPs, and/or
5   one or more Voice Response Systems, VRSs, which IN is capable of
interacting with a PSTN [= Public Switched Telephone Network] or ISDN
[= Integrated Services Digital Network].

In the current implementations of IN standards (AIN 0.1, AIN
0.2, CS1 and CS2), there is only provided for playing, through IPs,
10 announcements by VRSs and for receiving DTMF tones [DTMF = dual tone
multiple-frequency]. In the current, modern IP and VRS
implementations, however, there is offered much more functionality
than playing a simple message and receiving DTMF tones. If it is
desired to make use of said, more complex functionality, in most cases
15 this will mean that the IP also collects more complex information on a
call from the PSTN. For many services, it is of importance to switch
through, after receiving said information, to a subsequent
destination, the destination being determined on the basis of the
information collected. Since the IP cannot return information to the
20 SCP, however, the IP itself will always maintain control over the call
and will have to carry out interpretations, if any. The consequence
is that any routing-through must always be switched by way of IPs (or
VRSs). In doing so, the available lines on the IPs (and VRSs) are
occupied for a longer period of time, which is a major impediment for
25 the application of modern IPs and VRSs.

SUMMARY OF THE INVENTION

The object of the present invention is to see to it that,
contrary to the aforementioned prior art, the IP or VRS does return
30 the information collected to the SCP; the IP or VRS may then return
the call to the Service Switching Point (SSP), so that the line is
vacated on the IP or VRS. On the basis of the information received,
the SCP may instruct the SSP to switch the call through to another
destination. To attain said envisaged object, the network according
35 to the invention provides for a control member which, on one side, is
connected to the outputs of the IPs and/or the VRSs, for recording
information signals given off by said IPs and VRSs, respectively,
which stem from calls from the PSTN, offered to said IPs and/or VRSs

2

by way of the SSP, which control member buffers the signals recorded from the IPs and VRSs, while on the other side the control member is connected to the SCP for outputting the information signals to the SCP on behalf of the IPs and VRSs.

5   Using the control member proposed by the invention, several IP or VRS modules may be simply coupled together within one call, without special IP-IP interfaces or lines being required. In the event of application of the concept according to the invention, the IPs or VRSs are occupied only for the minimum period of time required. Since in

10   this concept the SSP always activates the IPs or modules, there is no interface required between modules mutually. Combinations of modules within a service may therefore be easily realised. Thus, e.g., a module for the validation of a new credit card may be easily integrated into existing services by including a module call in the

15   service. If modules are already in use, any desired combination with said modules is possible, without the need of adjusting the interface for existing modules.

Since the SSP continuously sets up new outgoing calls when going through the various modules, it is possible to adopt a different rate

20   for each module. In this case, fixing rates may take place by way of the regular SSP rate-fixing. If no use is made of the concept according to the invention, switching-through will have to be done by the IP and, as to the SSP rate-fixing, only one rate will be permitted for the entire conversation.

25   By placing a central control member on the coupling between an IP or VRS, there is realised a central interface point with which not only may there be driven SCPs but, e.g., also be written or retrieved information from external data bases. Said coupling is of particular importance for services where telephony services are combined with

30   data services (also called Computer Telephony Integration, or CTI). An example thereof is the synchronisation of data screens towards operators having client data and the incoming calls from clients towards said operators.

Furthermore, the concept is very flexible as various IPs (VRSs)

35   may be chosen for each module. Combining modules is arranged from the SCP and switched by way of the SSP. As a result, all modules may be combined in random order. If modules (having new possibilities) are later added, they may be combined, in a service, with any existing

modules. Architecture proposed:

EXEMPLARY EMBODIMENTS

      FIG. 1 shows the "Super-IP" architecture proposed by the
5   invention. The figure shows a PSTN/ISDN 1 and, as part of an
Intelligent-network architecture, an SSP 2, to which a number of VRSs
and an IP 5 are connected. The SSP is additionally connected to an
SCP. According to the invention, there is mounted a control member 6
which forms a buffer and a coupling between the IPs and VRSs and the
10   SCP, as a result of which the SCP may be controlled by advanced
control signals from modern IPs and VRSs without, however, using said
(expensive) elements any longer than strictly necessary: the output of
said elements is included and buffered by the control member 6 until
the SCP is capable of using said buffered information. The coupling
15   (designated by bold lines in the figure) may therefore be used for
exchanging data collected for the call. There may also be given
instructions, possibly by way of the coupling by the IP, VRS or
control component, to the SCP for further processing the call. By
having the coupling take place by way of a central control member,
20   there originates a central coupling point which may also be used as a
bridge to the IT world, such as external IT systems and/or data bases,
represented by a network 7, such as the Internet. The protocol used
between the IPs and VRSs and the control member is TCP/IP [TCP –
transmission control protocol]; said protocol is also used for
25   communication with the Internet 7. In the connection between the
control member 6 and the SCP, the INAP protocol [?] is used.

      The central control member 6 may also use the information from
the IPs and VRSs for driving a Computer-Telephony-Integration (CTI)
coupling towards desired final destinations (determined in, or by way
30   of, the control member and passed on to the SCP). An example thereof
is a transmission pop-up data screen having client information (on the
basis of signalling information received, such as the telephone number
of the caller) to the final destination (operator) who in
synchronisation also receives the call from the client. Within this
35   concept, the central control member operates as a synchronisation
point for the telephony and data services. Since, in this concept,
the SCP and SSP will take care of the eventual switching-through of a
call, there automatically arises the option of network ACD [=

4

Automatic Call Distributor] and CTI solutions.

The great advantages when applying the concept according to the invention are:

- There is a briefer occupation of IP and VRS line capacity since

5   the IP or VRS need not switch through but may also return the control and the call to the SCP and the SSP. IPs and VRSs are deployed in part of the call as a result of which, within one call, more IPs and/or VRSs may be easily addressed. In addition, IP/VRS applications may be simply and flexibly combined within one service.

10   - The concept may be simply extended as ever more new IPs and/or VRSs may be used as modules. By applying the concept, the interface problems between IPs and/or VRSs are limited to a minimum.

Since for any module there are set up separate sub-conversations, there may be adopted a different rate for each
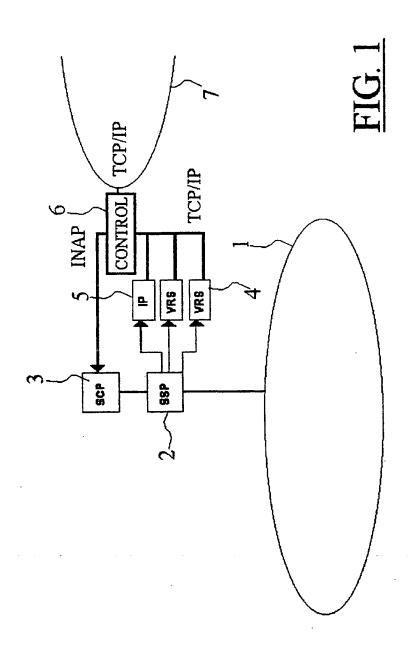
15   module.

Synchronisation of telephony and data services is feasible using the central control member.

- Since the SCP continues to control the switching-through of the call (and not the IP, VRS or PABX [= Private Automatic Branch

20   eXchange]), upon application of this concept network ACD and CTI solutions may be realised in a simple manner.

CLAIMS

        Intelligent network (IN), comprising at least one Service
Switching Point, SSP (2), at least one Service Control Point, SCP (3),
one or more Intelligent Peripherals, IPs (5), and/or one or more Voice
5   Response Systems, VRSs (4), which IN is capable of interacting with a
PSTN or ISDN (1), characterised by a control member (6) which, on one
side, is connected to the outputs of the IPs and VRSs, respectively,
for including the information signals given off by said IPs and VRSs,
respectively, which stem from calls from the PSTN or ISDN, offered to
10 said IPs and VRSs, respectively, by way of the SSP, which control
member buffers the signals included from the IPs and VRSs,
respectively, while the control member is connected, on the other
side, to the SCP for, on behalf of the IPs and VRSs, respectively,
giving off to the SCP, control signals controlled by said information
15 signals.

FIG. 1

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6   H04Q3/00   H04M3/42

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6   H04Q   H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KIHL ET AL.: "On overload control of intelligent peripherals in Intelligent Networks" GLOBAL TELECOMMUNICATIONS CONFERENCE 1996, vol. 3, 18 - 22 November 1996, pages 1539-1543, XP002076720 see page 1539, right-hand column, last paragraph - page 1540, right-hand column, line 47 ---	1
A	CHOPRA: "Exploring intelligent peripheral configurations" INTERNATIONAL CONFERENCE ON UNIVERSAL PERSONAL COMMUNICATIONS,25 September 1994, pages 635-639, XP000600315 san diego us see page 637, right-hand column, line 9 - page 638, right-hand column, line 49 ---	1

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| X | Further documents are listed in the continuation of box C. | X | Patent family members are listed in annex. |

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
7 May 1999	17/05/1999

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl. Fax: (+31-70) 340-3016	De Muyt., H

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INTERNATIONAL SEARCH REPORT

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 572 583 A (WHEELER, JR. ET AL.) 5 November 1996 see abstract; claims 1,2; figure 4B ---	1
A	EP 0 750 432 A (SIEMENS AKTIENGESELLSCHAFT) 27 December 1996 see the whole document ---	1
A	PATENT ABSTRACTS OF JAPAN vol. 17, no. 219 (E-1358), 30 April 1993 & JP 04 354245 A (NEC CORP), 8 December 1992 see abstract -----	1

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 5572583	A	05-11-1996	US 5418844	A	23-05-1995
			US 5583920	A	10-12-1996
			US 5864614	A	26-01-1999
			US 5524146	A	04-06-1996
EP 750432	A	27-12-1996	NONE		

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